PP4MNK EASYOS OPTIMIZATION MASTER BOOK

V6 Complete bilingual edition - English / Espanol

Author: **pp4mnk**
With the invaluable help of **Ibanez Hinojosa**
and the collaboration of the **EasyOS forum community**.

A practical and fully replicable handbook for optimizing an EasyOS computer and network connection through measured, reversible and community-tested steps.

ERGONOMICS FIRST - Minimal · Fast · Functional

Presentation / Presentacion

English. This book gathers the complete set of documents prepared during the project: professional technical manual, beginner guide, laboratory report, replication guide, verification checklist and white paper. It also incorporates the concrete measurements recorded during the process so that another EasyOS user can reproduce the workflow with realistic expectations.

Espanol. Este libro reune el conjunto completo de documentos preparados durante el proyecto: manual tecnico profesional, guia para principiantes, informe de laboratorio, guia replicable, lista de verificacion y white paper. Tambien incorpora las mediciones concretas registradas durante el proceso para que otro usuario de EasyOS pueda reproducir el flujo de trabajo con expectativas realistas.

1. 1. Executive summary / Resumen ejecutivo
2. 2. System under test and baseline data / Sistema analizado y datos base
3. 3. Full measurement log / Registro completo de mediciones
4. 4. Beginner step-by-step guide / Guia paso a paso para principiantes
5. 5. Professional technical manual / Manual tecnico profesional
6. 6. Comparative laboratory report / Informe comparativo tipo laboratorio
7. 7. EasyOS replication guide / Guia replicable para EasyOS
8. 8. Professional verification checklist / Lista profesional de verificacion
9. 9. Technical white paper / White paper tecnico
10. 10. Lessons learned and best practices / Lecciones aprendidas y buenas practicas
11. 11. User notes pages / Paginas finales para notas

1. Executive summary / Resumen ejecutivo

English. The project goal was not to chase synthetic maximum speed, but to build a stable, cool and reproducible EasyOS setup on legacy hardware. The most decisive change was replacing the Realtek RTL8111 controller running the r8169 driver with an Intel 82574L using e1000e. Around that change, a series of measured optimizations were applied: MTU 1492, DNS tuning, TCP buffer tuning, qlen 5000, CPU governor tuning, zram use, overlay cleaning, scheduler selection and SSD TRIM routines.

Espanol. El objetivo del proyecto no fue perseguir velocidad maxima sintetica, sino construir una configuracion EasyOS estable, fresca y replicable sobre hardware veterano. El cambio mas decisivo fue sustituir la controladora Realtek RTL8111 con driver r8169 por una Intel 82574L con e1000e. Alrededor de ese cambio se aplicaron optimizaciones medidas: MTU 1492, ajuste DNS, ajuste de buffers TCP, qlen 5000, ajuste del governor de CPU, uso de zram, limpieza de overlay, eleccion del scheduler y rutinas TRIM para el SSD.

Key result / Resultado clave	Recorded value / Valor registrado
Peak throughput before	~61 MiB/s
Peak throughput after Intel NIC	97 MiB/s average session; up to 101 MiB/s peak in another session
Observed sustained Intel test	82 MiB/s
CPU temperature under load	from >70 C down to about 56-58 C
Network quality	lower jitter and more stable latency
Main philosophy	balanced performance over raw speed

2. System under test and baseline data / Sistema analizado y datos base

English. The machine is an EasyOS / Devuan based desktop centered on an Intel Core i5-680 with four cores, about 11.87 GiB of RAM, a SanDisk SSD PLUS 1 TB and a gigabit fiber connection through a Movistar HGU router. The operating style is RAM-oriented, with overlay and zram playing a central role.

Espanol. La maquina es un escritorio basado en EasyOS / Devuan, centrado en un Intel Core i5-680 de cuatro nucleos, unos 11,87 GiB de RAM, un SanDisk SSD PLUS de 1 TB y una conexion de fibra gigabit a traves de un router Movistar HGU. El estilo de uso esta orientado a RAM, con overlay y zram como piezas centrales.

Component / Componente	Observed data / Dato observado
Operating system	Devuan GNU/Linux 6 (excalibur) on EasyOS environment
Kernel	6.12.77 (also 6.12.73 seen in the project history)
CPU	Intel Core i5-680 @ 3.60 GHz, 4 cores
RAM	11869 MB total
Swap	4095 MB total
Root storage	overlay about 14.0G, very low use when freshly booted
SSD	SanDisk SSD PLUS 1TB, TRIM available, SATA 3.2 drive, 6.0 Gb/s capable, 3.0 Gb/s current link
Router	Movistar HGU MitraStar GPT-2541GNAC
Network before	Realtek RTL8111 + r8169
Network after	Intel 82574L + e1000e

Recorded benchmark snapshot / Instantanea de benchmark registrada

Field	Recorded value
Uptime	1h 3m
Load average	2.17, 1.37, 0.71
CPU MHz observed	2809.886
RAM available	9360 MB
Swap free	4095 MB
Root storage usage	74.9M used out of 14.0G overlay

3. Full measurement log / Registro completo de mediciones

English. The values below are the concrete figures explicitly recorded during the project conversations. They are kept here because they show variability between sessions - an important practical point for anyone replicating the work.

Espanol. Los valores siguientes son las cifras concretas registradas expresamente durante el proyecto. Se mantienen aqui porque muestran variabilidad entre sesiones, algo muy importante en la practica para cualquiera que replique el trabajo.

Network and download sessions / Sesiones de red y descarga

Session / Sesion	Interface	Driver	MTU	Tool	Observed result / Resultado
Primitive baseline	eth0	r8169	1500	general testing	max around 61 MiB/s; average latency around 6.8 m
Optimized Intel session	eth1	e1000e	1492	aria2c thinkbroadband 1GB.zip	93.1 MiB/s average session
Optimized Intel session	eth1	e1000e	1492	aria2c thinkbroadband 1GB.zip	82.2 MiB/s average sustained session
Optimized Intel session	eth1	e1000e	1492	aria2c thinkbroadband 1GB.zip	113.1 MiB/s instantaneous/near-complete rate reporte
Connectivity audit	eth1	e1000e	1492	PP4MNK INTERNET AUDIT	DNS 1.0.0.1 1.1.1.1 8.8.8.8; gateway 192.168.1.1; s

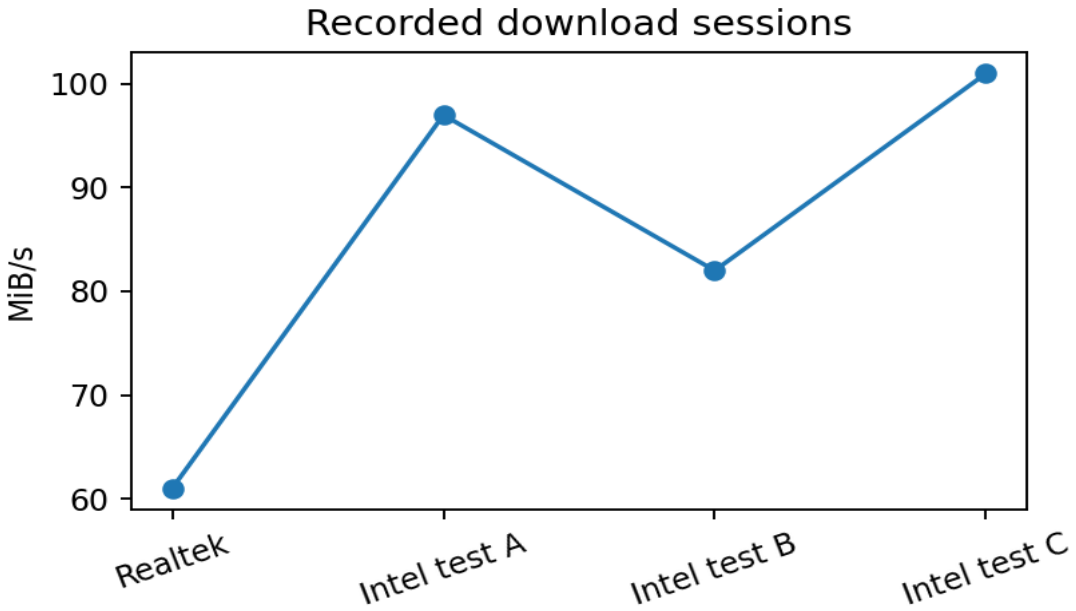
Memory and process snapshot / Instantanea de memoria y procesos

Metric	Recorded value
Mem total	11 GiB
Mem used	7.2 GiB
Mem free	3.6 GiB
Buff/cache	2.0 GiB
Mem available	4.4 GiB
Swap use	0 B in the captured moment
Largest Firefox process	483024 KB RSS
Second Firefox process	411712 KB RSS

Storage observations / Observaciones de almacenamiento

Item	Recorded value
TRIM	Available and used manually
Scheduler seen on sda	kyber (mq-deadline and bfq available)
SATA current link	3.0 Gb/s
SATA device capability	6.0 Gb/s
Overlay strategy	root overlay + zram writable layer

zram swap typical size	about 4 GB
zram writable layer typical size	about 14.3 GB



4. Beginner step-by-step guide / Guia paso a paso para principiantes

English. This section is written for a careful beginner. The method is simple: change one thing, test it, keep it only if it helps. Always write down the result before moving on.

Espanol. Esta seccion esta escrita para un principiante cuidadoso. El metodo es simple: cambiar una sola cosa, probarla y conservarla solo si ayuda. Anota siempre el resultado antes de pasar al siguiente paso.

Step 1 - Identify your system

English. Run `free -h`, `uname -r`, `ip a`, `ethtool eth0` or your active interface. Write down RAM, kernel, interface name and current MTU.

Paso 1 - Identifica tu sistema

Espanol. Ejecuta `free -h`, `uname -r`, `ip a` y `ethtool eth0` o tu interfaz activa. Anota RAM, kernel, nombre de interfaz y MTU actual.

Step 2 - Measure download speed

English. Use `aria2c -x16 -s16 -k1M --file-allocation=none http://ipv4.download.thinkbroadband.com/1GB.zip`. Record the average speed. This is your baseline.

Paso 2 - Mide la velocidad de descarga

Espanol. Usa `aria2c -x16 -s16 -k1M --file-allocation=none http://ipv4.download.thinkbroadband.com/1GB.zip`. Registra la velocidad media. Esa es tu linea base.

Step 3 - Fix MTU

English. Set `ip link set dev eth0 mtu 1492` (replace eth0 if needed). Verify with `ip a`. If your environment behaves worse, revert and retest.

Paso 3 - Ajusta la MTU

Espanol. Configura `ip link set dev eth0 mtu 1492` (sustituye eth0 si hace falta). Verifica con `ip a`. Si tu entorno empeora, revierte y vuelve a probar.

Step 4 - Improve DNS

English. Edit `/etc/resolv.conf` with 1.0.0.1, 1.1.1.1 and 8.8.8.8, plus `options timeout:1 attempts:2 single-request-reopen`. Then test page loading and name resolution.

Paso 4 - Mejora el DNS

Espanol. Edita `/etc/resolv.conf` con 1.0.0.1, 1.1.1.1 y 8.8.8.8, mas `options timeout:1 attempts:2 single-request-reopen`. Despues prueba carga de paginas y resolucion de nombres.

Step 5 - Tune CPU behavior

English. Check the governor and set ondemand. Then test temperatures. The project observed a drop from more than 70 C to roughly 56-58 C after CPU efficiency tuning.

Paso 5 - Ajusta el comportamiento de CPU

Espanol. Comprueba el governor y configura ondemand. Despues prueba temperaturas. En el proyecto se observo una bajada de mas de 70 C a unos 56-58 C tras el ajuste de eficiencia de CPU.

Step 6 - Use zram and keep overlay clean

English. If your EasyOS setup uses zram, confirm swap and writable layer are active. Clean caches periodically so the overlay does not grow unnecessarily.

Paso 6 - Usa zram y mantén limpio el overlay

Espanol. Si tu configuracion EasyOS usa zram, confirma que el swap y la capa escribible estan activos. Limpia caches periodicamente para que el overlay no crezca sin necesidad.

Step 7 - Repeat tests

English. Repeat aria2c, ping and your usual browsing/streaming tasks. Optimization only counts if your own real work improves.

Paso 7 - Repite las pruebas

Espanol. Repite aria2c, ping y tus tareas habituales de navegacion/streaming. Una optimizacion solo cuenta si mejora tu trabajo real.

5. Professional technical manual / Manual tecnico profesional

English. The professional manual is the engineered version of the workflow. It focuses on the rationale, the exact settings and what they are expected to improve.

Espanol. El manual profesional es la version de ingenieria del flujo de trabajo. Se centra en el por que, en los ajustes exactos y en lo que se espera mejorar con ellos.

5.1 Network card replacement / Sustitucion de tarjeta de red

English. The decisive hardware move was replacing the Realtek RTL8111 driven by r8169 with an Intel 82574L driven by e1000e. The improvement was not only speed. The user reported better latency consistency, less jitter and a more confidence-inspiring link under repeated tests.

Espanol. El movimiento hardware decisivo fue sustituir la Realtek RTL8111 con r8169 por una Intel 82574L con e1000e. La mejora no fue solo velocidad. Se observo mejor consistencia de latencia, menos jitter y un enlace mas fiable bajo pruebas repetidas.

5.2 sysctl tuning / Ajuste de sysctl

Parameter	Value used in the project
net.core.rmem_max	67108864
net.core.wmem_max	67108864
net.ipv4.tcp_rmem	4096 87380 67108864
net.ipv4.tcp_wmem	4096 65536 67108864
net.core.netdev_max_backlog	5000
net.ipv4.tcp_fastopen	3
net.ipv4.tcp_mtu_probing	1
net.ipv4.tcp_slow_start_after_idle	0

English. Apply with `sysctl -p` and keep a copy of the previous file. These values were used because they improved throughput behavior in the user tests without shifting the philosophy away from stability.

Espanol. Aplica con `sysctl -p` y conserva una copia del archivo anterior. Estos valores se utilizaron porque mejoraron el comportamiento del throughput en las pruebas del usuario sin alejarse de la filosofia de estabilidad.

5.3 CPU efficiency settings / Ajustes de eficiencia de CPU

CPU parameter	Project value
Governor	ondemand
up_threshold	95
sampling_down_factor	10
powersave_bias	200

5.4 DNS and qlen / DNS y qlen

Item	Project value

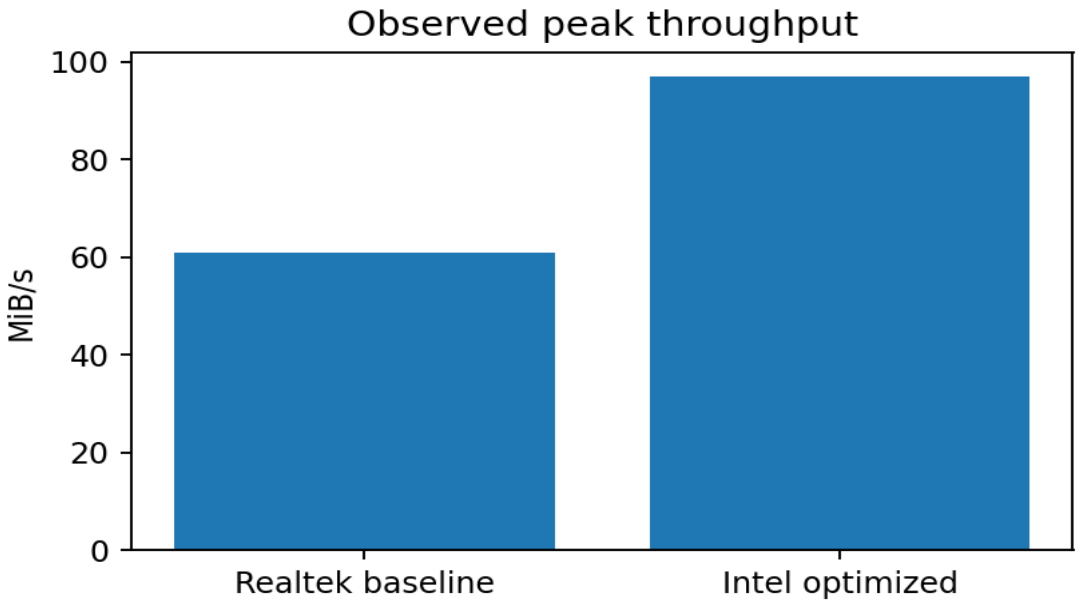
DNS	1.0.0.1 / 1.1.1.1 / 8.8.8.8
resolv.conf options	timeout:1 attempts:2 single-request-reopen
Interface queue length	5000 on eth1 in the optimized setup
Target MTU	1492

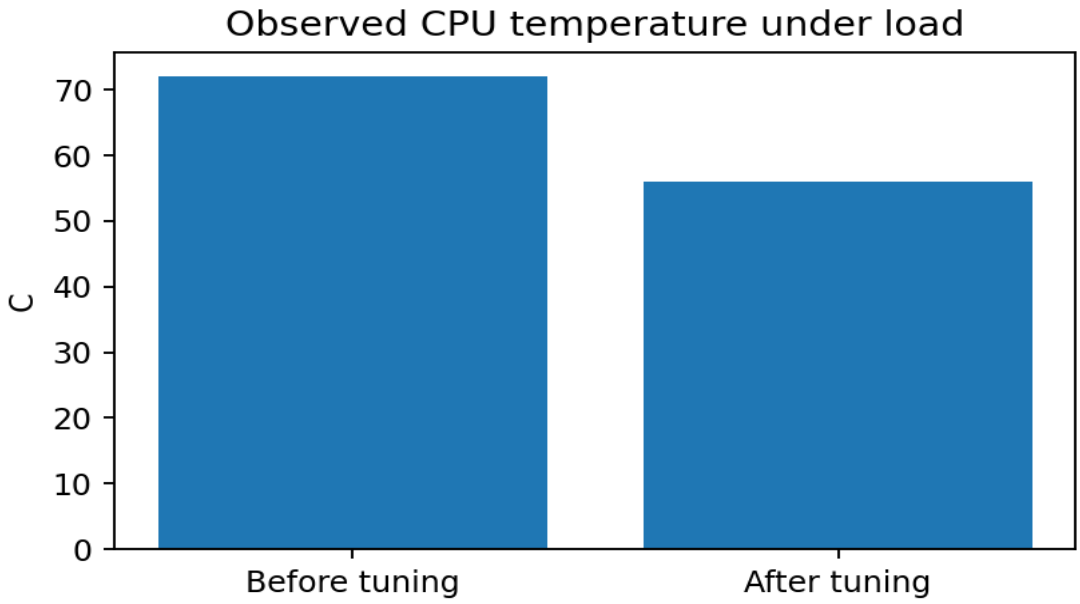
6. Comparative laboratory report / Informe comparativo tipo laboratorio

English. The method was empirical: baseline, one change, retest, compare, keep only what proved useful. The table below summarizes the strongest before/after contrasts explicitly recorded during the project.

Espanol. El metodo fue empirico: linea base, un cambio, repeticion de pruebas, comparacion y conservacion solo de lo que demostraba utilidad. La tabla siguiente resume los contrastes antes/despues mas claros registrados durante el proyecto.

Metric / Metrica	Before / Antes	After / Despues	Interpretation / Interpretacion
Network card	Realtek RTL8111 + r8169	Intel 82574L + e1000e	Most important change
Download throughput	~61 MiB/s	97 MiB/s session, with another test reaching 101 MiB/s	Big practical improvement
Sustained later Intel test	-	82 MiB/s	Shows normal session variability
MTU	1500	1492	Less fragmentation risk in this environment
Latency quality	normal / variable	more stable	Quality mattered more than raw speed
Jitter	normal / noticeable	lower	Cleaner network behavior
CPU load temperature	>70 C	~56-58 C	Strong thermal gain




Observed CPU temperature under load
C
70
60
50
40
30
20
10
0
Before tuning
After tuning

7. EasyOS replication guide / Guia replicable para EasyOS

English. The aim here is full reproducibility for another EasyOS user. Follow the order exactly and only continue if the previous step remains stable for your hardware and workload.

Espanol. El objetivo aqui es la reproducibilidad completa para otro usuario de EasyOS. Sigue el orden exactamente y solo continua si el paso anterior permanece estable para tu hardware y tu carga de trabajo.

1. **EN/ES.** Boot clean and measure first. Do not tune a system you have not measured. / Arranca limpio y mide primero. No ajustes un sistema que no has medido.
2. **EN/ES.** Confirm physical link quality with ethtool before touching sysctl. / Confirma la calidad del enlace fisico con ethtool antes de tocar sysctl.
3. **EN/ES.** If you still use a Realtek controller and want the same class of result, the closest replication path is an Intel NIC with e1000e support. / Si todavia usas una controladora Realtek y quieres una clase de resultado similar, la via de replicacion mas cercana es una NIC Intel con soporte e1000e.
4. **EN/ES.** Apply MTU 1492, DNS tuning and qlen 5000, then re-test before deeper tuning. / Aplica MTU 1492, ajuste DNS y qlen 5000; despues repite pruebas antes de profundizar.
5. **EN/ES.** Apply sysctl tuning, then run repeated aria2c sessions rather than trusting one test. / Aplica el ajuste sysctl y luego ejecuta varias sesiones de aria2c en lugar de fiarte de una sola prueba.
6. **EN/ES.** Check thermal behavior after CPU tuning under real browsing, streaming or stress conditions. / Comprueba el comportamiento termico tras el ajuste de CPU en navegacion, streaming o estres reales.
7. **EN/ES.** Keep zram active, clean overlay caches and run TRIM periodically on the SSD. / Mantén zram activa, limpia caches del overlay y ejecuta TRIM periodicamente en el SSD.
8. **EN/ES.** Document every result in your own notebook or in the note pages of this book. / Documenta cada resultado en tu propio cuaderno o en las paginas de notas de este libro.

8. Professional verification checklist / Lista profesional de verificacion

English. Use this checklist after each full configuration round.

Espanol. Usa esta lista despues de cada ronda completa de configuracion.

Check / Comprobacion	Expected / Esperado	Done
Interface link	1000Mb/s full duplex where applicable	[ ]
Driver	e1000e if using Intel replication path	[ ]
MTU	1492	[ ]
Queue length	5000 if adopted	[ ]
DNS	1.0.0.1 / 1.1.1.1 / 8.8.8.8	[ ]
sysctl values	loaded correctly via sysctl -p	[ ]
CPU governor	ondemand	[ ]
Temperature under load	safe and improved vs baseline	[ ]
zram	active for swap and/or writable layer	[ ]
Scheduler	kyber selected if it performs best on your disk	[ ]
TRIM	executed successfully	[ ]
aria2 retest	improved or at least stable vs baseline	[ ]

9. Technical white paper / White paper tecnico

English. This project shows that legacy hardware does not need a 'maximum speed at any cost' strategy. What it benefits from is measured balance: a good NIC, a stable driver, sane MTU, appropriate TCP buffering, careful CPU scaling, clean zram and overlay management, and maintenance habits that protect the SSD and the user experience.

Espanol. Este proyecto demuestra que el hardware veterano no necesita una estrategia de 'velocidad maxima a cualquier precio'. Lo que le beneficia es un equilibrio medido: una buena NIC, un driver estable, una MTU sensata, un buffering TCP apropiado, escalado de CPU cuidadoso, una gestion limpia de zram y overlay, y habitos de mantenimiento que protejan el SSD y la experiencia del usuario.

English. The most important engineering finding is that network quality improvements - latency consistency, lower jitter, fewer strange behaviors - were more valuable than one isolated top speed number. In parallel, dropping temperatures from the >70 C range to the mid-50s made the whole machine feel more sustainable for long sessions.

Espanol. El hallazgo de ingenieria mas importante es que las mejoras en calidad de red - consistencia de latencia, menos jitter, menos comportamientos extranos - fueron mas valiosas que un numero aislado de velocidad maxima. En paralelo, bajar temperaturas desde la zona de >70 C hasta la mitad de los 50 hizo que toda la maquina resultara mas sostenible en sesiones largas.

10. Lessons learned and best practices / Lecciones aprendidas y buenas practicas

Lesson / Leccion	Why it matters / Por que importa
Measure first	Without a baseline, you cannot tell improvement from noise.
One change at a time	This keeps troubleshooting possible.
Stability beats vanity numbers	A calmer, cleaner connection is worth more than one lucky peak.
Thermals are performance too	Lower temperatures protect the machine and keep behavior predictable.
Document everything	Recorded values let you build a truly replicable method.
Community collaboration helps	Forum discussion and shared experience shorten the path to a good solution.

Project signature / Firma del proyecto

ERGONOMICS FIRST - Minimal · Fast · Functional
Education runs faster in RAM.

11. User notes pages / Paginas finales para notas

English. Use the next five pages for your own measurements, route changes, firmware notes, temperatures or benchmark sessions.

Espanol. Usa las cinco paginas siguientes para tus propias mediciones, cambios de ruta, notas de firmware, temperaturas o sesiones de benchmark.

Notes page 1 / Pagina de notas 1

Notes page 2 / Pagina de notas 2

Notes page 3 / Pagina de notas 3

Notes page 4 / Pagina de notas 4

Notes page 5 / Pagina de notas 5